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(71) Applicant(s)
Fook Tin Plastic Factory Limited

(Incorporated in Hong Kong)

4th Floor, Eastern Centre, 1065 King's Road, Hong Kong

(72) Inventor(s)
Fredy Chi Chiu Cha

(74) Agent and/or Address for Service
Marks & Clerk
57-60 Lincoln's Inn Fields, LONDON, WC2A 3LS, United Kingdom

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GB 2269021 A GB 2229541 A US 5233520 A
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(54) Electronic weighing scale

(57) An electronic weighing scale comprises a body incorporating a weighing mechanism and an alphanumeric display (9), and an internal electronic control circuit for responding to the weighing mechanism and displaying the weight of a food item on the display (9). The control circuit includes a ROM memory storing a set of names of food items and a set of corresponding nutrition values per unit weight, a keyboard (10) for selecting one food item from the set of names, and calculating means for calculating the nutrition value according to the measured weight and the associated unit-weight nutrition value, for displaying on the display (9).

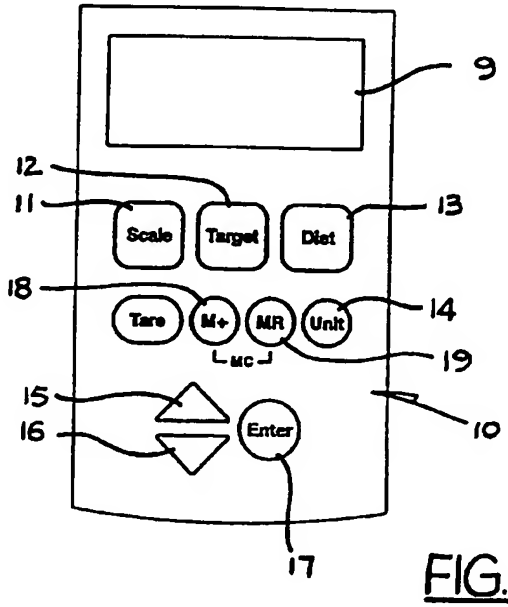

FIG. 1

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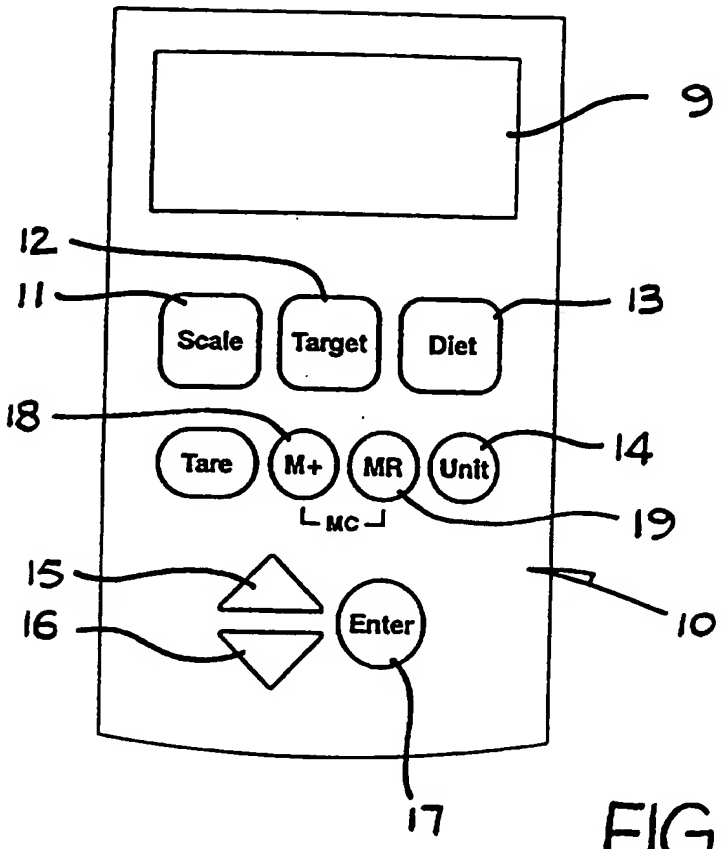

FIG. 1

BY CATEGORY	FOOD ITEM	cal	kJ	Protein (g)	Fat (g)	Glucose (g)	Sodium (mg)	Fiber (g)	Cholesterol (mg)
VEGETABLE	OLIVE, BLACK	3.38	14.534	0.022	0.358	0.271	32.88	0.044	0
MEAT	BACON	3.13	13.459	0.126	0.27	0.055	10.5	0	0.53

FIG. 2

BY ALPHABET	FOOD ITEM	cal	kJ	Protein (g)	Fat (g)	Glucose (g)	Sodium (mg)	Fiber (g)	Cholesterol (mg)
B	BACON	3.13	13.459	0.126	0.27	0.055	10.5	0	0.53
O	OLIVE, BLACK	3.38	14.534	0.022	0.358	0.271	32.88	0.044	0

FIG. 3

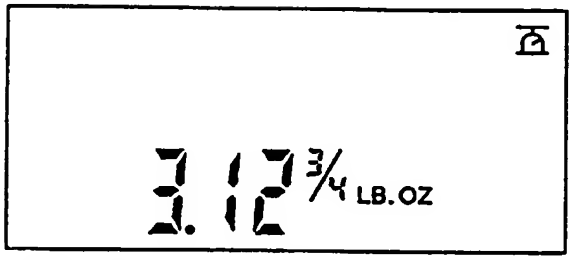

FIG.4A

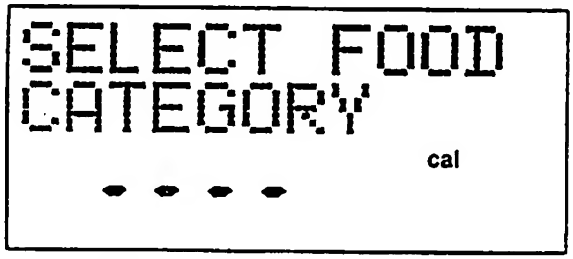

FIG.4B

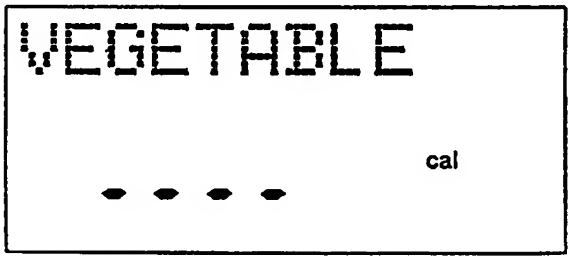

FIG.4C

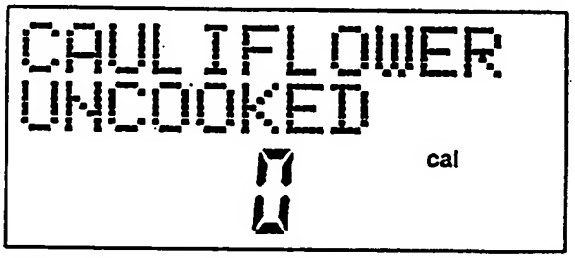

FIG.4D

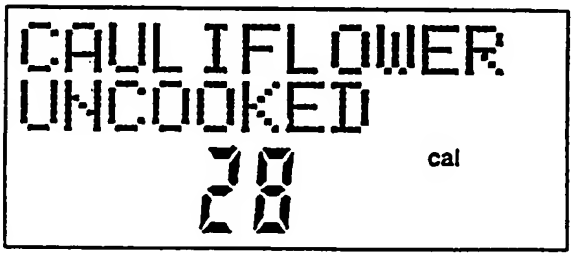

FIG.4E

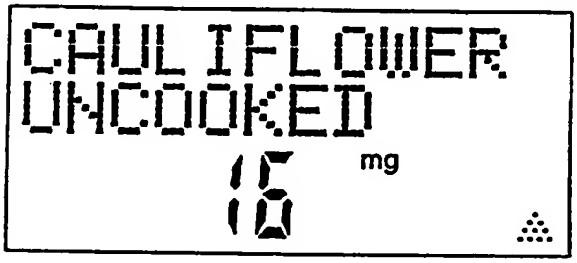

FIG.4F

ELECTRONIC WEIGHING SCALE

The present invention relates to an electronic weighing scale which is capable of calculating and displaying the nutrition value of weighed food.

According to the invention, there is provided an electronic weighing scale which comprises a body incorporating a weighing mechanism and a display, and an internal electronic control circuit for responding to the weighing mechanism and displaying the weight of a food item on the display, said control circuit including memory means for storing a first set of data representing the names of certain food items and a second set of data representing the corresponding nutrition values per unit weight, keying means for selecting one food item from the first set of data to be displayed on the display, and calculating means for calculating the nutrition value of a said weighed food item, according to the associated nutrition value per unit weight, for displaying on the display.

It is preferred that the first set of data comprises the name of said food items.

Preferably, the keying means has a key for repeated pressing to scroll through the food item names on the display to be selected.

In a preferred embodiment, the food item names are firstly classified according to their general nature and then arranged according to their specific nature.

In another preferred embodiment, the food item names are arranged according to their alphabetical order.

It is preferred that the second set of data comprises nutrition values per unit weight of each food item in different nutrition units which are selectable by means of the keying means.

Preferably, the keying means has a key for repeated pressing to scroll through the nutrition units on the display to be selected.

In a preferred embodiment, the control circuit includes internal user memory and signalling means, and is adapted to activate the signalling means when the calculated nutrition values in a specific nutrition unit accumulated in the user memory reaches or exceeds a corresponding predetermined nutrition value pre-stored in the user memory.

More preferably, the keying means is adapted to initially enter the predetermined nutrition value into the user memory and to subsequently enter the calculated nutrition value every time when a food item is weighed for the

calculating means to determine an accumulated nutrition value for comparison with the predetermined nutrition value.

It is preferred that the signalling means is adapted to provide a sound signal when so activated.

It is an advantage that the memory means is adapted to be replaceable by users for changing the data stored therein.

The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a front view of a control panel of an embodiment of an electronic weighing scale in accordance with the invention;

Figure 2 is a part of a table of food item names and the corresponding nutrition values per unit weight stored in the electronic weighing scale of Figure 1;

Figure 3 is a part of an alternative table of food item names and the corresponding nutrition values per unit weight stored in the electronic weighing scale of Figure 1; and

Figures 4A to 4F show sequential display screens of the

control panel of Figure 1, illustrating the operation of the electronic weighing scale.

Referring firstly to Figure 1 of the drawings, there is shown a control panel of an embodiment of an electronic weighing scale in accordance with the invention, which control panel is formed an alphanumeric or dot-matrix LCD (liquid crystal display) display 9 on its upper part and a keyboard 10 on its lower part. The electronic weighing scale has three operating modes, namely SCALE, TARGET and DIET which are selectable by means of corresponding keys 11, 12 and 13 of the keyboard 10. The keyboard 10 further includes a UNIT key 14, a pair of up and down arrow keys 15 and 16, an ENTER key 17, and M+ and MR keys 18 and 19.

As in known electronic weighing scales, the weighing scale of this invention also has a body (not shown) which incorporates a weighing mechanism (including a weighing bowl or pan) and an internal electronic control circuit for responding to the weighing mechanism and displaying the measured weight. In the SCALE mode, the present weighing scale operates as a normal weighing scale.

Reference is also made to Figures 2 and 3 of the drawings. The internal control circuit is microprocessor-based and incorporates internal user memory. The control circuit includes a ROM (read-only memory) IC chip storing an electronic manual formed by a set of food item names,

including for example "olive, black", "beacon" and "cauliflower, uncooked" and by a set of corresponding nutrition values per unit weight, in different nutrition units, of the food items. The nutrition units of the nutrition values per unit weight are selectable in turn by means of the UNIT key 14 from the following pre-determined set: "cal (Calorie)", "kJ (kilo-Joule)", "Protein (g)", "Fat (g)", "Glucose (g)", "Sodium (mg)", "Fibre (g)" and "Cholesterol (mg)". In the DIET mode, the control circuit is designed to calculate the nutrition value (in a selected nutrition unit) of a certain quality of a particular food item placed on the weighing scale by multiplying the measured weight of the food item by the corresponding internally stored unit-weight nutrition value, and then to display the same on the LCD display 9. The unit-weight nutrition values in the various nutrition units may be predetermined on the basis of per 10g, 50g, 100g or the like of food items.

The internal set of food item names is stored in either one of two alternative manners. In the first manner (as illustrated in Figure 2), the food item names are firstly classified according to their general categories, such as "vegetable" and "meat", and then under each category arranged in alphabetical order according to their specific natures, such as "cauliflower, uncooked" and "olive, black" under "vegetable", and "beacon" under "meat". In the second manner (as illustrated in Figure 3), the food item

names are arranged in alphabetical order based on the first and then subsequent letters, such as "beacon", "cauliflower, uncooked" and then "olive, black".

The operation of the weighing scale will now be described with reference to Figures 4A to 4F of the drawings, showing the sequential display screens of the LCD display 9. Upon pressing of the "SCALE" key 11, the scale functions as a regular electronic weighing scale. In this SCALE mode, a weighing scale sign is displayed at the top right corner of the LCD display 9 and the measured weight of an object placed on the scale is displayed on the lower part, as shown in Figure 4A.

The weighing scale turns into the DIET mode when the DIET key 13 is pressed. In this particular embodiment, the food item names are classified according to their general categories and then arranged according to their specific natures, as described above. Initially, the words "SELECT FOOD CATEGORY" are displayed on the upper part of the LCD display 9, as shown in Figure 4B. The user is then required to press the up or down arrow key 15 or 16 repeatedly to scroll through the food categories which are displayed in turn on the upper part of the LCD display 9 until the desired food category is displayed, for example "VEGETABLE" as shown in Figure 4C. Pressing of the ENTER key 17 will confirm this selection. Subsequently, the user is required to press again the up or down arrow key 15 or

16 repeatedly to scroll through the list of specific food item names which are displayed one-by-one on the upper part of the LCD display 9 until the correct food item name is displayed, for example "CAULIFLOWER UNCOOKED" as shown in Figure 4D. Pressing of the ENTER key 17 once more will confirm this selection. A certain amount of the desired food item is finally placed on the weighing pan or bowl of the weighing scale. The internal control circuit will immediately determine the weight of the food item, calculate the total nutrition value of the food item by multiplying the measured weight by the corresponding unit-weight nutrition value, and then display the same on the lower part of the LCD display 9 as shown in Figure 4E.

In the alternative manner, the food item names are arranged in alphabetical order according to initially the first letters and then the second letters for the same first letter and so on. Initially, the LCD display 9 will prompt for the first letter to search by displaying "SELECT A-Z". The user then presses the up/down arrow key 15/16 to scroll through letters A-Z on the display 9 to select the first letter wanted, for example the letter "O". Thereafter, a list of all food item names starting with the same first letter "O", in alphabetical order according to the second and subsequent letters, is available for the user to scroll through by means of the up/down arrow keys 15/16 until the desired food item name, such as "OLIVE, BLACK", is displayed for confirmation by pressing the ENTER key 17.

In the described operation, the weighing scale determines the nutrition value in the nutrition unit of "Calorie" as indicated by the "cal" sign on the LCD display 9. The nutrition unit can be selected, either before or after the weighing operation, by repeated pressing of the UNIT key 14 to turn on the corresponding indicator signs of the available nutrition units one-by-one. For example, Figure 4F shows the selection of the nutrition unit of "Sodium" (indicated by the dotted triangular sign) in milligram measure (indicated by the "mg" sign). The new nutrition value of the weighed food item in "Sodium (mg)" will then be determined and displayed by making use of the corresponding unit-weight nutrition value in that nutrition unit.

Upon pressing of the TARGET key 12, the weighing scale enters into the TARGET mode, in which the nutrition unit must firstly be selected as described above, for example "Sodium". The user is then required to enter the desired or target nutrition value into a first register of the user memory by means of the up and down arrow keys 15 and 16, such as "100mg", which is to be confirmed by the ENTER key 17. Repeated momentary pressing of the up or down arrow key 15 or 16 will increase or decrease the displayed target nutrition value in predetermined small steps, and continuous pressing will change the displayed target nutrition value at a relatively faster pace.

Once the target nutrition unit and value are set, the TARGET function stays on. Every time when a certain amount of food item is placed on the weighing pan or bowl and the Sodium content is determined as described previously, pressing of the M+ key 18 will add this Sodium content to a second register of the user memory. The accumulated nutrition value of this second register may be recalled and read on the display 9 by pressing the MR key 19. When this accumulated nutrition value reaches or exceeds the preset target nutrition value in the first register, an alarm signal in beeps will be given by an internal speaker/buzzer of the weighing scale, indicating that the target nutrition value has been reached or exceeded.

With the use of the target function, a user may monitor the quantity of a specific nutrition item or type of nutrition content, such as Sodium, taken over a certain period of time or normally in a day. The second register may be reset to zero by pressing the M+ and MR keys 18 and 19 simultaneously, as indicated by "MC" in Figure 1, for fresh operation.

The electronic weighing scale of this invention is useful as a dietary weighing scale which makes use of an internal or built-in electronic manual complied according to food item names and the corresponding nutrition values per unit weight. The electronic manual is stored in a ROM IC chip (or in any other suitable electronic data memory formats)

which may be replaced conveniently by users to update or change the stored data. It is envisaged that the food items may be displayed by means of their abbreviated names or graphic representations or according to a suitable coding scheme, or even identified by spoken names stored in an internal voice IC chip.

The invention has been given by way of example only, and various other modifications of and/or alterations to the described embodiment may be made by persons skilled in the art without departing from the scope of the invention as specified in the appended claims.

CLAIMS

1. An electronic weighing scale comprising a body incorporating a weighing mechanism and a display, and an internal electronic control circuit for responding to the weighing mechanism and displaying the weight of a food item on the display, said control circuit including memory means for storing a first set of data representing the names of certain food items and a second set of data representing the corresponding nutrition values per unit weight, keying means for selecting one food item from the first set of data to be displayed on the display, and calculating means for calculating the nutrition value of a said weighed food item, according to the associated nutrition value per unit weight, for displaying on the display.

2. An electronic weighing scale as claimed in claim 1, wherein the first set of data comprises the name of said food items.

3. An electronic weighing scale as claimed in claim 2, wherein the keying means has a key for repeated pressing to scroll through the food item names on the display to be selected.

4. An electronic weighing scale as claimed in claim 3, wherein the food item names are firstly classified according to their general nature and then arranged

according to their specific nature.

5. An electronic weighing scale as claimed in claim 3, wherein the food item names are arranged according to their alphabetical order.

6. An electronic weighing scale as claimed in any one of claims 1 to 5, wherein the second set of data comprises nutrition values per unit weight of each food item in different nutrition units which are selectable by means of the keying means.

7. An electronic weighing scale as claimed in claim 6, wherein the keying means has a key for repeated pressing to scroll through the nutrition units on the display to be selected.

8. An electronic weighing scale as claimed in any one of the preceding claims, wherein the control circuit includes internal user memory and signalling means, and is adapted to activate the signalling means when the calculated nutrition values in a specific nutrition unit accumulated in the user memory reaches or exceeds a corresponding predetermined nutrition value pre-stored in the user memory.

9. An electronic weighing scale as claimed in claim 8, wherein the keying means is adapted to initially enter the

predetermined nutrition value into the user memory and to subsequently enter the calculated nutrition value every time when a food item is weighed for the calculating means to determine an accumulated nutrition value for comparison with the predetermined nutrition value.

10. An electronic weighing scale as claimed in claim 8 or claim 9, wherein the signalling means is adapted to provide a sound signal when so activated.

11. An electronic weighing scale as claimed in any one of the preceding claims, wherein the memory means is adapted to be replaceable by users for changing the data stored therein.

12. An electronic weighing scale substantially as hereinbefore described with reference to Figures 1 to 4F of the accompanying drawings.

Patents Act 1977 14 Examiner's report to the Comptroller under Section 17 (The Search report)	Application number GB 9426321.7
Relevant Technical Fields (i) UK Cl (Ed.N) G1W (ii) Int Cl (Ed.6) G01G 19/414	Search Examiner A BURROWS Date of completion of Search 13 NOVEMBER 1995
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii) ONLINE: WPI	Documents considered relevant following a search in respect of Claims :- 1-12

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Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2269021 A	(NEUTRON ELECTRONIC) whole document	1,2,4
X	GB 2229541 A	(WALSH) whole document	1-3,8,10
X	US 5233520	(USA) whole document	1,2
X	US 5033561	(HETTINGER) whole document	1,2,4
X	US 4911256	(SENTRON) whole document	at least 1-6
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